4/4/00

RMRS Rocky Mountain Remediation Services, L.L.C.
. . . protecting the environment

INTEROFFICE MEMORANDUM

0000060723

DATE: January 5, 1996

TO: Distribution

FROM: S. M. Paris, Accelerated Actions, Bldg. T893B, X3656 SMP

SUBJECT: COMMENT REVIEW REQUEST FOR RMRS REVIEW OF THE DRAFT INTERAGENCY AGREEMENT UNDERGROUND STORAGE TANK SOURCE REMOVAL PROGRAM SAMPLING AND ANALYSIS PLAN – SMP-001-96

ACTION: Please review and return comments by January 15, 1996

Attached is the Draft Interagency Agreement Underground Storage Tank Source Removal Sampling and Analysis Plan (SAP) (Attachment 1). This SAP has been prepared by the Accelerated Actions Group and is submitted to you for comments. Please use the attached review comment sheet to document your comments (Attachment 2). Please review and return your comment sheet to me by January 16, 1996. Your cooperation in this matter is appreciated.

If you have any questions or need additional information regarding the above document, I can be contacted at extension 3656 or digital page 4624. You can also contact Mark Burmeister at extension 5891 or digital page 4630.

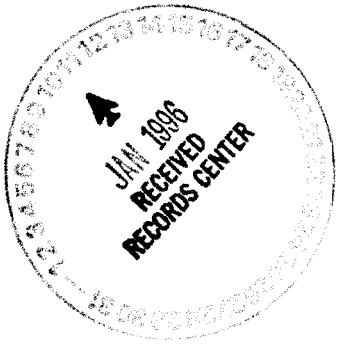
jlm

Attachments:
As Stated (2)

Distribution

M. C. Broussard
M. C. Burmeister
G. D. DiGregorio
S. C. Evans
L. B. Johnson
J. E. Law
S. L. Myrick
M. T. Saba
ER Records Center (2)

22.150F



ADMIN RECORD

IA-A-000564

1/42

Attachment 1
SMP-001-96

RMRS REVIEW DRAFT
INTERAGENCY-AGREEMENT
UNDERGROUND STORAGE TANK
SOURCE REMOVAL PROGRAM
SAMPLING AND ANALYSIS PLAN

Rocky Flats Environmental Technology Site

US DEPARTMENT OF ENERGY
Rocky Flats Environmental Technology Site
Golden, Colorado

JANUARY 1996

2

Effective Date: _____

APPROVED BY:

_____

Remediation Manager, Accelerated Actions Date

_____

Quality Assurance Program Manager Date

_____

Vice President, Environmental Restoration Date

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF STANDARD OPERATING PROCEDURES (SOPs)

IDENTIFICATION NUMBER	PROCEDURE TITLE
L-6294A	*Sample Procedures for Waste Characterization*

General Radiochemistry and Routine Analytical Services Protocol, Part A and B (GRRASP, 1991)

LIST OF ACRONYMS

BNA	Base/Neutral/Acid
COC	Chain-of-Custody
DMP	Data Management Plan
DOE	Department of Energy
EPA	Environmental Protection Agency
GRRASP	General Radiochemistry and Routine Analytical Services Protocol
HASP	Health and Safety Plan
IHSS	Individual Hazardous Substance Site
LLW	Low Level Waste
OU	Operable Unit
pCi/g	Picocuries per Gram
pCi/l	Picocuries per Liter
QAA	Quality Assurance Addendum
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RFETS	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RMRS	Rocky Mountain Remediation Services, LLC
SAP	Sampling and Analysis Plan
SVOA	Semi-volatile Organic Analysis
SVOC	Semi-volatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
µCi/g	Microcuries per Gram
µCi/l	Microcuries per Liter
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound
WAC	Waste Acceptance Criteria

5

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) describes the specific analytical needs, verification, and waste characterization sampling requirements, sampling disposition, data handling requirements, data quality objectives (DQOs), and quality assurance/quality control (QA/QC) required for the IAG Underground Storage Tank (UST) Source Removal Project at the Rocky Flats Environmental Technology Site (RFETS).

This action assumes that: (1) Tank 2 and Tank 40 are breached and contain groundwater; (2) Tanks 10 East and West, Tank 14 and Tanks 16 North and South contain process wastes; (3) sludges may be present in Tanks 2 and 3, Tank 10 West, and Tank 40 and require waste characterization; (4) the sites are located within individual hazardous substance sites (IHSS); and (5) the contaminated media and wastes generated from this action are to be treated or stored onsite. This SAP provides the methodology for implementing the sampling associated with the source removal action.

1.1 Background

Operable Unit No. 9, Original Process Waste Lines, consists of 40 tank locations and approximately 35,000 feet of pipeline. A portion of the OU No.9 RCRA RFI/RI was conducted as part of the RCRA corrective action. To expedite the RFI/RI, the first stage (Stage 1) of the investigation was divided into three parts: (1) tanks outside large buildings, (2) tanks inside large buildings, and (3) pipelines. The field investigation of tanks outside large buildings was completed and the data was evaluated and each tank site (or IHSS) was ranked according to risk to human health and the environment. A prioritized list of the Rocky Flats Environmental Technology Site's (RFETS) IHSS was developed to select the top priority IHSSs (or portions of IHSSs) for remediation. The ranking was completed according to the Environmental Restoration Ranking document (RMRS, 1995). Six of the tank sites were ranked in the top 20 sites of the prioritization list. Four of the six tank sites were ranked in the top 5 sites.

Tanks 2 and 3 are located north of Building 449 and comprises IHSS 122 in Operable Unit No.8. The tank(s) consists of a wet well, limestone bed, and 6,000-gallon holding tank. A portion of the holding tank is overlain by a pump vault and a head chamber. Building 449 has been constructed above the wet well and approximately one-half of the limestone bed. The Tank 10 site is located north of Building 776. Tank 10 includes two 4,500-gallon tanks. Tank 14 is a 30,000-gallon process waste tank west of and adjacent to Building 774. Tank 16 site is composed of two 14,000-gallon process waste tanks and is also located west of and adjacent to Building 774. The tank 16 site is located north of Tank 14. Tank 40 is located west of Building 889. Two 1,000-gallon tanks and a vault comprise tank 40. The tanks and a portion of the vault are filled with groundwater.

The scope of the IAG UST Source Removal Project includes the removal of residuals including liquids and sludges from six tanks located at four sites. The tanks will be rinsed out with potable water and rinsate samples will be collected following each rinse. The tanks will be filled with a closed-cell foam material following the final rinsing effort.

1.2 Summary of the Source Removal Action

The IAG USTs have been selected for accelerated remedial actions based on risk. The risk analysis was performed utilizing analytical results from samples collected in support of Technical Memorandum No.1, Addendum to the Phase I RFI/RI Work Plan, Operable Unit No.9, Original Process Waste Lines (DOE, 1994).

The proposed actions include the following:

- Removal of residual materials including sludges and liquids remaining in the tanks;
- Collecting samples of sludges and intermediate and final rinsates.
- Containerization of sludges, and temporarily storing waste prior to treatment/disposal;
- Rinsing the interior of the tanks; and
- Filling tanks with a closed-cell foam.

The sampling activities required to support these actions includes:

- Sampling of previously uncharacterized sludges, if encountered;
- Rinsate sampling to document the effectiveness of the rinsing process; and
- Final rinsate sampling to document quality of final rinse waters.

2.0 OBJECTIVE AND SCOPE

The objective of this SAP is to identify the specific analytical needs, sampling requirements, data handling requirements and associated quality assurance/quality control (QA/QC) requirements for completion of source removals from the IAG USTs. More specifically, this includes the completion of one or more of the following objectives:

- To determine the effectiveness of the cleaning/rinsing methodology;
- To generate adequate and defensible information to characterize the rinsate and final rinsate waters removed from the USTs; and
- To characterize sludges and liquid wastes generated from this removal action.

It should be noted that these actions may not remove all contamination. The objectives of this action is to remove contamination at the source and rinse tanks utilizing a high pressure wash. Rinsate samples will then be collected from the tanks to document the effectiveness of the rinsing process. The water utilized for this effort will be a potable water source.

Based on the objectives described above, the scope and contents of this SAP will include:

- Defining appropriate sampling methods;
- Identifying the time and number of samples to be taken;
- Describing the analytical requirements and appropriate sampling methods;
- Developing QA/QC requirements including data quality objectives; and

- Generating adequate information for characterization, storage and/or disposal purposes.

3.0 SAMPLING APPROACH AND REQUIREMENTS

The planned source removal action will consist of pumping/removal of tank liquids and sludges. The source removal will be conducted by trained Rocky Flats Environmental Technology Site maintenance staff equipped with appropriate personal protective equipment. The action will be conducted using hand tools and pumps.

The tanks currently contain liquids (process wastes and/or groundwater), Tanks 10, 14, and 16 are also known to contain sludges. The first removal activity will be to pump existing liquids from the tanks to allow sludge removal activities. Liquids will be pumped to a tanker or through a pipeline to permitted onsite treatment facility. Liquids have previously been sampled and analyzed, results are provided in the OU No.9 Draft Summary 2, Operable Unit No.9, Outside Tanks (DOE, 1995). Sludges have been characterized for Tanks T-10 East, Tank T-14 and Tanks T-16 North and South. If Tanks T-2, Tank-10 West and Tank 40 are determined to hold sludges the sludges will be sampled prior to or following containerization. The timing of the sampling event will be determined in the field based on the unknown quantities and containerization requirements. Tank 10 sludges may be resuspended and pumped via a constructed pipeline to Building 774.

The removal action will require a four step approach to sludge, water, and rinsate sampling. The first step will be to collect additional samples of sludges, is required, and/or samples of previously uncharacterized sludges for waste acceptance criteria parameters. The sludges and liquids may be sampled insitu or after being placed in a waste container. The second sampling step is to obtain samples of the source water to be utilized in the final rinsing of the tanks. The purpose of this sample is to determine a baseline quality of waters utilized in the rinsing process.

The third set of samples to be collected include a samples of waters generated from each rinsing effort. The samples will be submitted to the laboratory for screening purposes. The purpose of these screening sample is to determine the effectiveness of the rinsing by determining the quality of water following each effort. The results of the most recent sampling effort will be compared to the previous sampling results to determine if the rinsing effort is effective. If no appreciative decrease (30%) in target parameters is realized the rinsing effort will be considered completed. A minimum of three rinsing efforts will be performed for each tank.

The fourth (final) sample to be collected will consist of water generated during the final rinsate. The final rinsate sample will be collected for definitive data analysis. This sample will be utilized to document the effectiveness of the rinsing process by determining the quality of the final rinsate water. The sample may be collected following the third rinse effort in anticipation that the third rinse was effective. If the screening sample results indicate that the rinse effort was not successful the samples will be discarded and the tank will be rinsed again and the screening and final rinsing efforts will be conducted again until the 30% decrease in target parameters are meet.

3.1 Collection of Sludge Samples

Field sampling personnel will collect additional samples of sludges, liquids and/or samples of previously uncharacterized sludges (if encountered) for waste characterization purposes. Sludges have not been encountered in Tanks 2 and 3, Tank 40, and Tank 10 West. Samples will be collected from each tank prior to or following containerization of the material. The samples of sludge will be collected utilizing RFETS procedure L-6294A, Sample Procedures for Waste Characterization.

Samples of previously uncharacterized sluges will be collected, if encountered, in each tank for waste acceptance criteria and will be analyzed for parameters provided in Table 3-1. The VOC samples will be collected as discrete grab samples (not composited). The samples may be collected insitu or following containerized depending on field conditions.

3.2 Collection of Rinse Water Blank Sample

A blank sample will be collected from the discharge of the pressure washer prior to the rinse effort to establish a water quality baseline of the potable water utilized for the final rinsing process. The quality of the rinse water may be impacted from transporting the water to the tank site by the water hose utilized or from residuals in a tank. One blank sample will be collected per water delivery mechanism for the project. For example, if water is delivered to the site by a tanker truck one sample will be collected to baseline tanker water quality. If water is delivered by a water hose a sample will be collected to establish the water quality baseline from the hose. If the water hose is changed or replaced during the project an additional blank sample will be collected. The sampling suite will consist of CLP analytical parameters identical to the final rinsate program for VOCs, semi-VOCs, total metals, and radionuclides. Table 3-1 provides the analytical program for the blank sample of the rinse water source.

3.3 Collection of Rinsate Samples

Rinsate samples will be collected of water generated from rinsing of the tank to document the effectiveness of the rinsing process. Rinsate samples will not be collected following the initial sludge removal and first rinsing of tank. To clarify, the first rinse water generated from the tank will most likely be utilized to mobilize sludges not removed during the gross sludge removal process. This rinse water will not be sampled. However, subsequent water generated from rinsing the tanks will be collected and analyzed for screening purposes. Rinsate samples will be submitted for metals and VOC sweeps only. The sweep is an analytical method that will provide acceptable detection limits and quick laboratory turnaround. The results will be utilized to guide field personnel during the rinsing effort. Table 3-1 presents the analytical program for rinsate samples.

3.4 Collection of Final Rinsate Samples

Samples of the final rinsate will be collected for laboratory analysis to document rinse water quality following the completion of rinsing activities and prior to the foaming of the tanks. The final rinse sample will be collected following confirmation the rinsing effort has been effective. The final rinsate samples will be collected for VOCs, semi-VOCs, metals, and radioanalytical parameters. Table 3-1 provides the analytical program for final rinsate samples.

3.5 Sample Collection, Preservation, and Handling

The collection of all samples will be in accordance with appropriate procedures. The collection of samples will follow Procedure L-6245-F, Section 6.1, Method of Collection/Sampling Equipment. Radioactive screening of samples will be performed according to Section 6.4.4 of Procedure L-6245-F for all samples collected in support of this program.

Tables 3-2 and 3-3 present sample containers, preservation and handling requirements for sludge and rinsate (liquid) samples respectively.

3.6 Decontamination of Sampling Equipment

All sampling equipment will be decontaminated prior to and following the collection of sludge and water samples according to Procedure L-6245-F, Section 6.2.2, Equipment Decontamination. Decontamination procedures for sampling equipment is included in Procedure L-6245-F, Sampling Procedure for Waste Characterization. Decontamination activities and will be documented in maintenance (field) log books in accordance to Procedure L-6245-F Section 8, Records.

3.7 Personnel Health and Safety

Project personnel will adhere to the Integrated Operable Units 8, 9, 10, 13, & 14 Phase I RFI/RI Final Health and Safety Plan (HASP) and the project's activity hazard analysis/preliminary hazard analysis (AHA/PHA).

4.0 ANALYTICAL REQUIREMENTS

The analytical specifications for this project will follow the protocol described in the General Radiochemistry and Routine Analytical Services Protocol (GRRASP) (EG&G, 1993). The GRRASP describes the protocol for analytical methods that will be used, detection limits, holding times, laboratory COC, extraction/preparation criteria and reporting requirements.

4.1 Data Needs

The data needs for this project include the collection of sufficient information of adequate quality to meet the specific objectives of the project. As described above, this includes characterization of the sludge materials for RCRA constituents, requirements for Land Disposal Restriction (LDR) criteria, and determining the radiological classification of waste as a Low Level Waste (LLW) or Transuranic Waste (TRU). The quality requirements for the removal action are described in the data quality objectives section of Appendix B, Quality Assurance Addendum (QAA).

4.2 Analytical Methods

The analytical methods that will be used to support the DQOs of the IAG Tank Source Removal Project can be found in Tables 3-1.

5.0 DATA MANAGEMENT REQUIREMENTS

The specific data management requirements for this SAP are defined and described in Appendix A, Data Management Plan (DMP). This DMP will be followed for all data collection, compilation and dissemination activities for this project.

10

6.0 QUALITY ASSURANCE/QUALITY CONTROL

The specific Quality Assurance/Quality Control requirements for this SAP are defined and described in QAA. This QAA will be followed for all QA/QC activities for this project.

7.0 REFERENCES

DOE, 1994. Technical Memorandum No.1, Addendum to the Operable Unit No.9 - Original Process Waste Lines Phase I RFI/RI Work Plan, Field Sampling Plan, Volume I, Part A-Outside Tanks. Environmental Restoration Program.

DOE, 1995. OU No.9 Draft Summary 2, Operable Unit No.9, Outside Tanks. Environmental Restoration Projects.

EG&G, 1993. General Radiochemistry and Routine Analytical Services Protocol (GRRASP).

EPA, 1986 (Revised Sept. 1994). Test Methods for evaluating Solid Waste: Physical/Chemical Methods; Third Edition (SW-846).

RMRS, 1995. Environmental Restoration Ranking. Environmental Restoration/Waste Management.

Table 3-1 IAG UST ANALYTICAL PROGRAM

Analysis	Method	Sludge	Rinsate	Rinse Water Blank	Final Rinsate
Radioanalytical Screen; Gross Alpha and Gross Beta	Gas Proportional Counting	X	X	X	X
Plutonium 239/240 Americium 241 Uranium Isotopes	Alpha Spectrometry	X		X	X
VOCs	EPA-CLP TCL	X		X	X
Semi-VOCs	Method 625	X		X	X
Metals	EPA-CLP TAL	X		X	X
Metals Sweep	MSWEEP		X		
VOC Sweep	VSWEEP		X		

Table 3-2 Sludge Sample Containers, Preservation, and Handling

Analyte	Matrix	Analytical Method	Container	Preservative	Holding Time
Gross Alpha Gross Beta (Rad Screen)	Solid	Gas Proportional Counting	125-ml plastic container	None	6 months
Plutonium 239/240, Americium 241, Uranium Isotopes	Solid	Alpha Spectrometry	500-ml wide-mouth glass jar	None	6 months
Total Metals	Solid	CLP Target Analyte list for Metals	250-ml wide-mouth glass jar with Teflon-lined lid closure	Cool, 4° C	Extraction 28 days, analysis with 180 days*
VOCs	Solid	EPA-CLP Volatile Organics Target Compound List	250-ml wide-mouth glass jar	Cool, 4° C	14 days until extraction, 14 days after extraction
SVOCs	Solid	Semi-Volatile Organics by EPA Method 625 - Regulated List	250-ml wide-mouth glass jar	Cool, 4° C	14 days until extraction, 40 days after extraction

Table 3-3 Rinsate Sample Containers, Preservation, and Handling

Analyte	Matrix	Analytical Method	Container	Preservative	Holding Time
Gross Alpha Gross Beta (Rad Screen)	Liquid	Gas Proportional Counting	125-ml plastic container	None	6 months
Plutonium 239/240, Americium 241, Uranium Isotopes	Liquid	Alpha Spectrometry	1 one-liter plastic containers	Nitric Acid <2 Cool, 4° C	6 months
Total Metals	Liquid	EPA-CLP SOW TAL	1 one-liter polyethylene bottle	Nitric Acid pH <2 Cool, 4° C	6 months, except mercury 28 days
VOCs	Liquid	EPA-CLP VOC TCL	40-ml VAO vials with Teflon l-lined septum lids	HCL pH < 2, Cool 4° C	14 days
Semi-VOCs	Liquid	SW-846 Method 625	2 one-liter amber glass bottles	Cool 4° C	7 days until extraction, 40 days after extraction

RMRS REVIEW DRAFT
IAG UST SOURCE REMOVAL PROJECT
SAMPLING AND ANALYSIS PLAN
APPENDIX A - DATA MANAGEMENT PLAN

Rocky Flats Environmental Technology Site

U.S. DEPARTMENT OF ENERGY
Rocky Flats Environmental Technology Site
Golden, Colorado

JANUARY 1996

15

TABLE OF CONTENTS

LIST OF FIGURES

116

1.0 INTRODUCTION

The purpose of this Data Management Plan (DMP) is to support the Sampling and Analysis Plan for the IAG Underground Storage Tank (UST) Source Removal Project and to identify the mechanisms and procedures for the efficient and accurate transfer of data from collection/generation of the data through its end-use. This is achieved by identifying the sources of data, establishing systematic procedures for quality assurance/quality control, and creating a suitable database to allow end users the appropriate access to meet project requirements and to establish appropriate security and back-up measures to ensure data integrity. The DMP identifies and defines sample documentation, sample tracking, data entry, data proofing, data reporting, and data management personnel responsibilities.

The IAG UST Source Removal Project will involve the collection and analysis of data from several sources:

- Sludge sampling for waste characterization purposes,
- Sampling of waters generated from intermediate rinsing efforts of the tanks; and
- Sampling of the waters generated from the final rinsing effort.

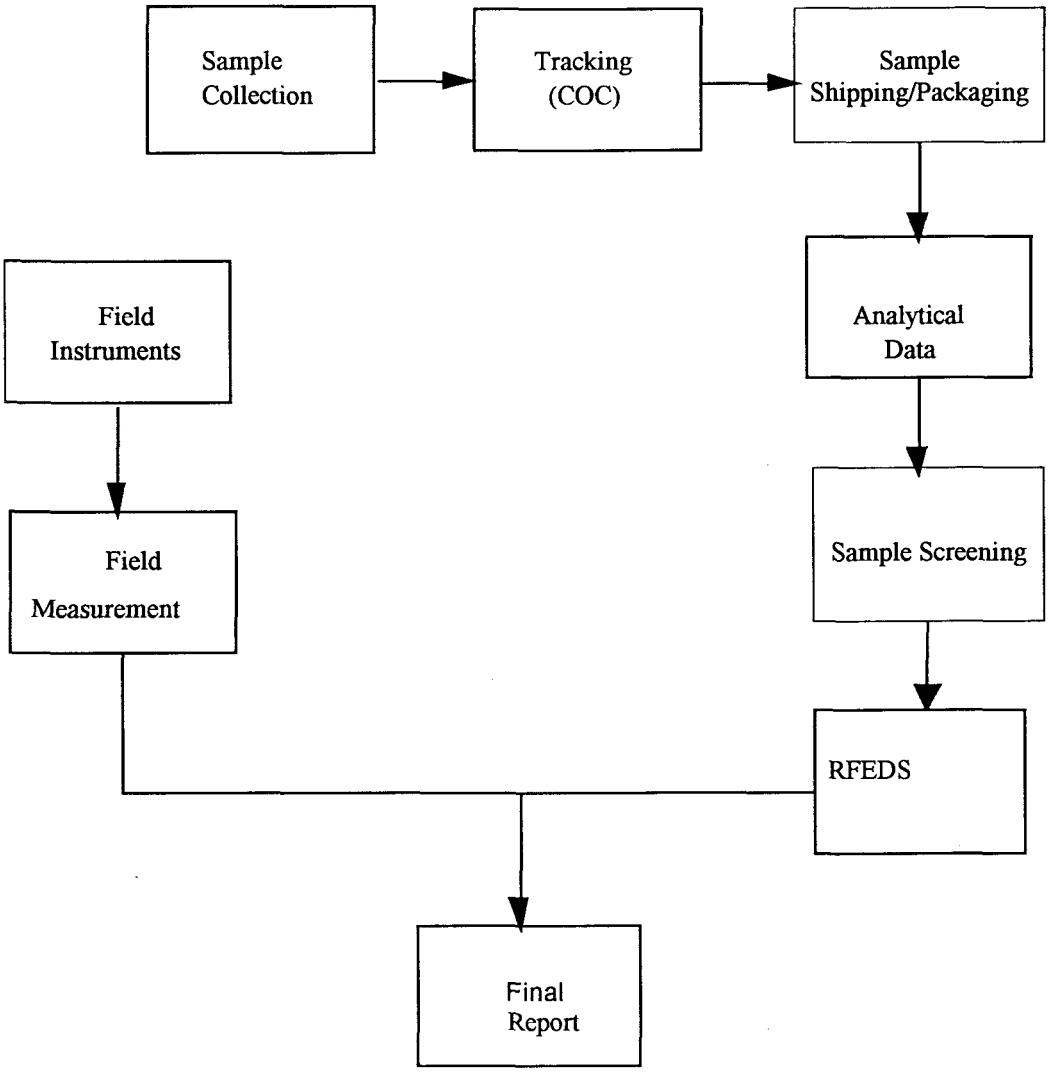
This DMP has been developed to promote the proper and complete management of scientific and technical data that will be generated from the IAG UST Source Removal Project. The primary purpose of a DMP is to communicate to personnel collecting, using, and managing information how this information will be recorded, stored, accessed, and reviewed. Procedures are defined and implemented to ensure that data are collected, entered, and stored in a secure, controlled, and retrievable manner to accurately and efficiently transfer data into useful information. This plan addresses the planning, implementation, and responsibilities to optimize data management and use of the Rocky Flats Environmental Database System (RFEDS) and the interim database, Datacap.

This DMP focuses principally on the data management and data handling. A detailed discussion of peripheral activities (i.e., field data collection methods etc.) are described in the main portion of the Sampling and Analysis Plan (SAP). RFEDS will be the ultimate repository for all data generated during this project.

Tracking and verification of data at each stage of the project is important. The data tracking procedures identified in this DMP vary according to the data collection method employed. Figure 1-1 provides a summary of the data sources and the flow of the data.

Figure 1-1

SUMMARY OF DATA SOURCES AND DATA



2.0 RESPONSIBILITIES AND QUALIFICATIONS

Support staff for the data management tasks includes all personnel involved in data acquisition, quality control (QC), and data processing. The designated staff are responsible for implementing and carrying out data management activities according to this plan.

The primary personnel responsible for data management are the RMRS Team Leader, Sample Crew Personnel, Sample Manger, Qualified Technical Reviewer, Field Data Manager, RFEDS User System Manager (USM), Data Verifier and Project Quality Assurance/Quality Control (QA/QC) Officer. The responsibilities for these positions are summarized in the following sections.

2.1 RMRS Team Leader

The RMRS Team Leader will be responsible for ensuring that all data are collected, processed, and stored in a manner consistent with this DMP and in compliance with 5-21000-OPS-FO.14 Field Data Management. Data management support personnel will report to the RMRS Team Leader with any problems that may impact the integrity of the data and/or the removal action.

Prior to sample collection, the RMRS Team Leader will:

- Coordinate sample shipping with a RFETS Laboratory, or other approved analytical laboratory;
- Coordinate the overall field effort;
- Obtain RFEDS assigned sample numbers and location codes from the RFEDS USM to use on the Chain of Custody (COC) forms;
- Ensure assigned sample numbers are used on the proper sample bottles; and
- Ensure laboratory's capability to upload data into RFEDS system.

After sample collection, the RMRS Team Leader will:

- Manage any feedback from the laboratory.
- Ensure that any data from sample locations that have been surveyed are given to the RFEDS GIS group.
- Ensure that the appropriate authenticated quality-related records and Administrative Records are transmitted to the Central Records Center.

2.2 RFEDS User System Manager

The RFEDS User System Manager will:

Prior to sampling:

- Verify all locations of samples to be taken and assign any new location codes to sample locations.

- Assign sampler numbers, COC numbers, and any applicable codes and abbreviations for the RMRS Team Leader; and
- Ensure laboratory data transfer compatibility to RFEDs.

After sampling, the RFEDS USM will:

- Verify any transmitted records for accuracy and completeness.
- Ensure the data are preserved, retrievable, traceable, and available for response to regulatory agency requirements.

2.3 Sample Crew Personnel

The Sample Crew Personnel will be responsible for field data collection. Their tasks include:

- Completing all applicable entries on appropriate forms, and authenticate all forms;
- Completing all entries into field notebook;
- Documenting all field observations and data on field data forms;
- Recording field observations and data with black, waterproof ink;
- Delivering field data forms and corresponding COCs to the Sample Manager by the end of each day of field operations; and
- Delivering samples to the onsite laboratory or to the 891 laboratory.

2.4 Sample Manager

The Sample Manager is responsible for:

- Preparing sample bottles prior to sampling and to assure that the correct sample identification labels and locations are on labels;
- Receiving field data forms daily and reviewing for completeness and verifying that all forms have been received;
- Resolving any discrepancies with Sample Crew Personnel and clearly documenting any corrections, change, or insertions made as a result of discrepancy resolution;
- Verifying that the COCs are complete, accurate and error-free. When the COCs are complete, accurate, and error-free, and before samples are shipped to the contract laboratory, the Sample Manager will copy all COCs on a daily basis and place copies in T891E;
- Transferring the field data to the Field Data Manager for input into Datacap.

2.5 Qualified Technical Reviewer

The Qualified Technical Reviewer performs a technical verification of the data, including:

- Reviewing field data to ensure consistency with known chemical and physical properties of the media being sampled.

- Verifying all calculations and reported units.
- Verifying that the correct number of QC samples were collected.
- Resolving any discrepancies with Sampling Crew Personnel and clearly recording any and all corrections, changes, or insertions made as a result of discrepancy resolution.
- Ensuring that documentation for the verification of data in this record includes the date of verification and the initials of the verifier.

2.6 Field Data Manager

The Field Data Manager is responsible for:

- Entering any relevant field parameters into the appropriate Datacap module.
- Entering the COC/tracking information into the Tracking section of Datacap within two days of sample shipment to the analytical laboratory.
- Printing data from Datacap and giving it to the Data Verifier for review.
- Verifying that all samples intended to be collected are in Datacap.
- Transmitting field information, sample collection data, and COC tracking data to the RFEDS USM.
- Backing up and ensuring the security of Datacap.

2.7 Data Verifier

The Data Verifier will:

- Compare the original field data forms and Datacap printout for consistency and accuracy.
- Report any transcription errors and return them to data entry for correction.

2.8 RMRS Sample Management GIS Group

The RMRS Sample Management GIS Group receives surveying and sample data information from the RMRS Team Leader and digitizes the data.

2.9 Project QA/QC Officer

The Project QA/QC Officer will ensure that procedures are carried out in accordance with this DMP. The QA/QC Officer will report to the RMRS Team Leader or designee.

3.0 DATA HANDLING SYSTEMS EQUIPMENT, DATA BACKUP, AND SECURITY PROCEDURES

3.1 IAG UST Source Removal Project Data Handling and Storage Systems

The IAG UST Source Removal Project data handling and storage system will handle and store data including: field data forms for the field instrumentation (i.e., FIDLER), laboratory screening

data, and laboratory generated data from RFEDS. The raw data will be manually input into Datacap, an interim database in Microsoft Excel, by the Team Leader, Project Data Manager, or designee. Datacap is a PC-run, temporary database used to store the field data in an easily-retrievable and an easily recognizable manner by the RFEDS database, ORACLE, to ensure completeness and accuracy prior to data transfer to RFEDS.

Datacap is able to generate appropriate reports and tables, provide systematic review, and efficient access and retrieval to optimize data use after downloading from RFEDS or manual input. It is recognized that different types of data (e.g., physical and chemical parameters together with associated location information) from a variety of sources will be collected at various times.

The RFEDS data system is capable of managing fundamental sample data, reports, queries, and exports of the data. RFEDS is amenable to reporting either all or part of the data in selected fields. Furthermore, all or any subset of the data can be selected for review and analysis. RFEDS has the capability to export data to numerous personal computer applications such as Wordperfect, Autocad, Lotus, and Stratigraphics, and can be transferred in ASCII, Microsoft Excel, or DBASE III-compatible file formats.

3.2 Database Backup

3.2.1 Field Data Acquisition

Data manually acquired in the field will be directly entered onto the appropriate forms as raw data and will be subsequently entered into Datacap. A hard copy of the most recent version of the data will be kept with the data disks. The original data will be kept in an orderly manner in the RMRS Team Leader's office. Copies of all data collected, both disk and hard copy, will be sent to the Field Data Manager upon completion. The Sample Manager will be responsible for transmittal of the field data to the Field Data Manager.

3.2.2 Backup and Security Procedures

To limit the likelihood of data corruption and to maintain the integrity of the database, only the RMRS Team Leader, the Field Data Manager, and the RFEDS personnel will have unlimited access to the data by means of password protection. The Sample Manager will have entry/edit/query access. The individual user access privilege level will be designated by the RMRS Team Leader and the Field Data Manager. General user access for the hot spot removal database will be to query the chemical and field information. Data editing will be performed by the RFEDS USM, the Field Data Manager, or designees. It is also anticipated that once data are loaded, little or no changes to the data are expected. Any modifications to the data must receive the authorization of the Field Data Manager. Changes to the data will be documented as

described in Section 5.0 of this DMP, "DATA MANAGEMENT, DATA TRACKING, DATA ENTRY AND DATA PROOFING."

The RFEDS User System Manager or other RFEDS group member will back up RFEDS daily onto tape. This level of backup is considered to be sufficient for IAG UST Source Removal Project database. The Field Data Coordinator is responsible for backing up any data generated in the field by photocopying hard copies and backing up Datacap data daily to disk or tape.

4.0 DOCUMENTATION

4.1 Data Acquisition Documentation

It is necessary to record detailed information so that data acquisition can be reconstructed. The field log book will be utilized to document activities completed in the field. Data for IAG UST Source Removal Project will be compiled from a number of different sources. At a minimum, the electronically collected data records, field instrument data, and sample collection forms should include the following information for each data or sample point:

1. Field sample identification (ID)
2. Date and time of sampling/measurement
3. Sample measurement location
4. Sample measurement description
5. Sample depth (if appropriate)
6. Parameters or analyses being reported
7. Associated quality control (QC) samples (e.g., duplicates, matrix spikes, etc.)
8. Approximate levels (in counts/minute, parts per million etc.) of contaminants as reported by field instrumentation

If field changes are required which do not affect the quality of the data, the revisions will be recorded the field log book for reconstruction and justification of the work performed.

4.2 Transmittal of Field Data to Field Data Manager

All data generated in the field will be copied and transferred to the Field Data Manager or designee. This data will include COC forms, field notes, data generated by field instruments (i.e., FIDLER), and any other data generated in the field. Following shipment of data from the field to the Field Data Manager or designee, the Sample Manager will verbally confirm the data have been received. The field data will be transferred to the Datacap database by the Field Data Manager/RMRS Team Leader or designee. The data will then be transmitted to the RFEDS USM via diskette.

4.3 Data Receipt Confirmation

Upon receipt of the data, the Field Data Manager is responsible for checking, at a minimum that:

1. All data were received and the receipt was noted on the Field Data Transmittal Form.
2. The data received matches the data acquisition plans.
3. The appropriate field QC checks were performed (calibration of instruments, etc.)

The Field Data Manager will have the responsibility of ensuring that discrepancies identified during the checking process are corrected and documented.

5.0 DATA MANAGEMENT-DATA TRACKING, DATA ENTRY, AND DATA PROOFING

5.1 Manually Collected Field Data

Data collected manually will consist of field measurements of sludge thickness and liquid thickness. Figure 5-1 Manual Data Collection System Flow chart summarizes the data flow for the manually recorded data from collection through data reporting. The results and other pertinent information will be recorded on the appropriate data collection forms. The results from the forms will be entered into a PC database system. The data entry will be QC reviewed by the Project Data Manager prior to entry of the data.

5.2 RFEDS Analytical Data

Figure 5-2 summarizes the data flow for the analytical data. Analytical data will be obtained from RFEDS in electronic format. The data will be checked by the Data Verifier for format correctness and completeness. The RFEDS analytical data will be downloaded into Datacap to allow an end user to easily query the data from the database. Upon completion of downloading, the RFEDS USM will review the data for completeness in comparison to plan.

5.3 Data Entry

Data can be entered in two ways: (1) manual entry from data collection forms and analytical data sheets, and (2) data electronically downloaded from RFEDS.

5.3.1 Manual Data Entry

Manual data entry will be followed by a 100 percent data review by the Data Verifier. Errors will be researched and corrected. A hard copy of the manually entered data will be initialed and dated by the person performing the review.

5.3.2 Corrections and Changes to Sample Data

Changes or corrections may be required in the data stored in Datacap. All changes must be accompanied by a Data Correction/Change Form, Figure 5-3. The form will detail the changes to be made and document that the changes were completed. Corrections to the database will be reviewed by the Field Data Manager or designee for potential entry errors.

5.4 Data Verification/Technical Review

Problems encountered in data management are typically because of inconsistencies or errors in the data reporting. The field data in the database will be verified by the Data Verifier, who will compare a printed hard copy from the database to field forms using the procedures in RFP Procedure 5-21000-OPS-FO.14, *Field Data Management,* Section 7.5. Typical errors that are found include, but are not limited to, the following:

- Incorrect field sample numbers;
- Duplicate data and samples;
- Improper parameter names;
- Samples with missing data;
- Missing samples;
- Incorrect sample collection data;
- Incorrect units;
- Incorrect qualifiers;
- Missing detection limits, as applicable;
- Incorrect number of significant figures reported;
- Incorrect recording of times; and
- Inconsistencies in the sequences of data collection.

Data will be checked for transcription errors, accuracy and to ensure that all samples that were intended to be collected were collected, shipped, and entered into Datacap and that any samples that were intended to be collected, but not collected were clearly noted, verified, and entered in Datacap.

It is important that data inconsistencies and errors be identified as soon as possible to allow for correction prior to data use. To track the number of data points, samples, and analyses requested, it is important that all data (whether physical, chemical, or other parameters) be recorded and checked to verify that the data collected meet the project requirements.

5.5 Final QC Review

The following data final QC review procedures are applicable to all data acquisition for the project. These procedures are designed to ensure the final database in RFEDS is complete and correct.

- Complete database (RFEDS and Datacap) QC review. A hard copy of the database, organized by location, will be verified by the Field Data Manager or designee.
- Clearly mark corrections to the hard copy database report in red ink.
- Using the data entry sheets and sample collection sheets, check that data identifications are correctly listed on the database hard copy and the number of data points or number of samples for the removal are reported on the database hard copy.
- Check that all the parameters requested for each analysis are reported on the database hard copy and that units reported on the database hard copy are correct.
- Check that data time sequences are correct.
- Check values for all manually collected parameters reported from the database against the field collection forms, at a frequency of approximately 10 percent of the data for each test. If errors are found, an additional 10 percent of results will be checked for similar errors. If errors are found in the second 10 percent, all results will be checked.
- Check the corrected copy of the database to determine that corrections have been completed (i.e., verify the final hard copy of the database).
- The data will then be reviewed by a scientist familiar with the project objectives and data collection activity (Qualified Technical Reviewer) for data that do not make scientific sense (i.e., a concentration value of 2,000,000 mg/kg).
- Following completion of the QC procedure, the RMRS Team Leader, in consultation with the Project QA/QC Officer and Field Data Manager, will change the database reporting status to "FINAL."

Figure 5-1

MANUAL DATA COLLECTION SYSTEM

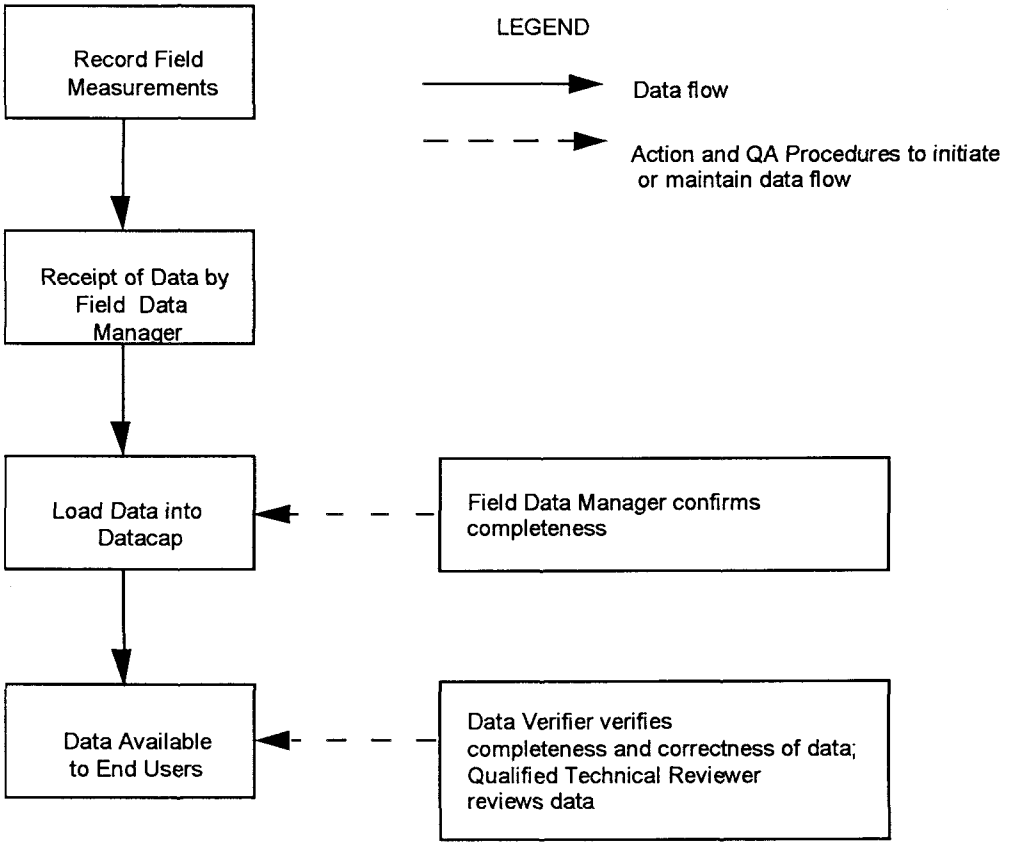


Figure 5-2

DATA FLOW FOR ANALYTICAL DATA

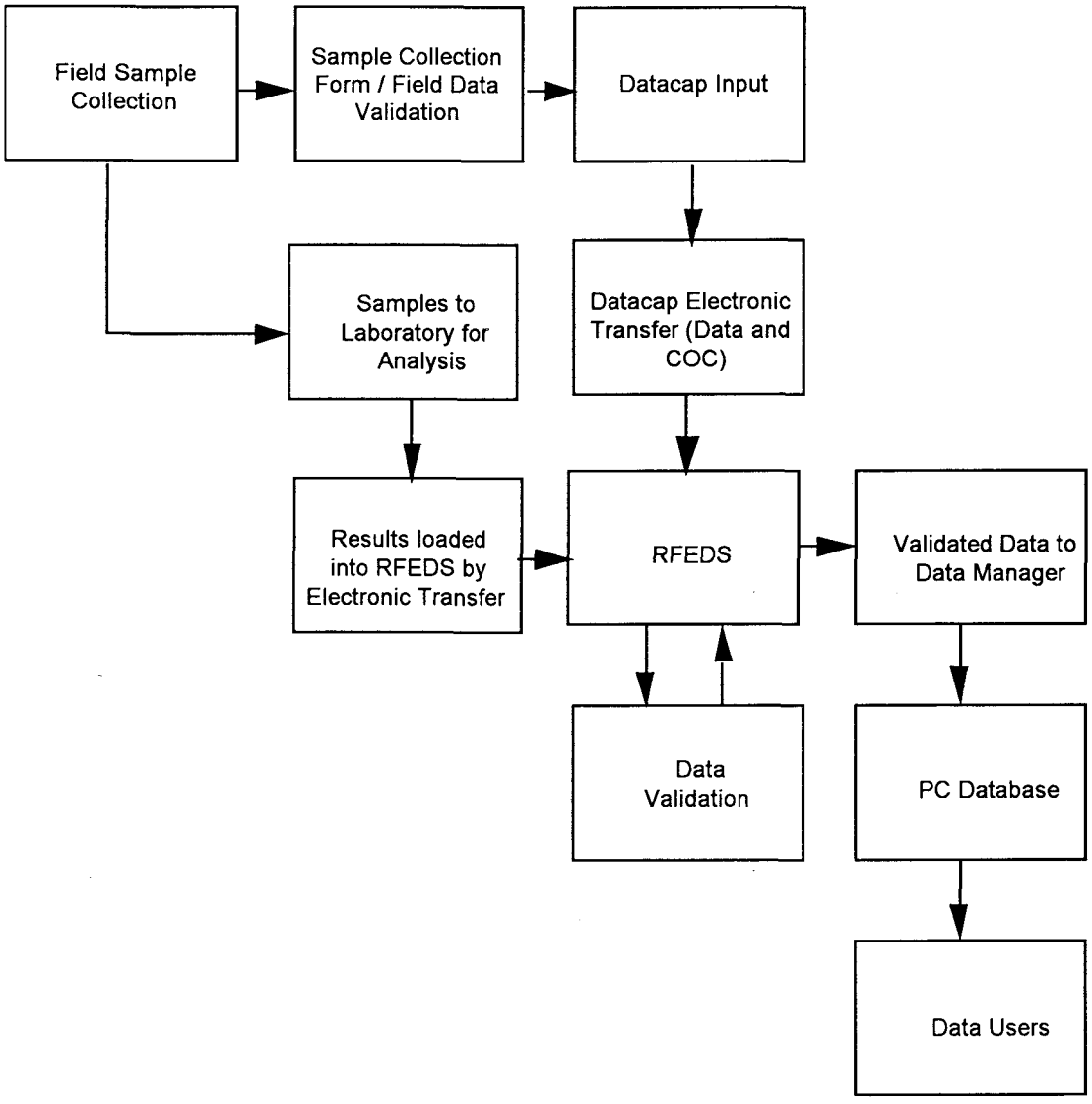


Figure 5-3

DATA CORRECTION/CHANGE

The following changes and/or corrections to the database are required (check all that apply):

_____ Data qualifiers have been assigned to the attached sample data

_____ The following sample analyses have been changed:

_____ Other changes or corrections (describe below):

Changes Requested By: _____
(Print Name) (Signature) (Date

Changes Made By: _____
(Print Name) (Signature) (Date

Changes Checked By: _____
(Print Name) (Signature) (Date

RMRS REVIEW DRAFT
IAG UST SOURCE REMOVAL PROJECT
SAMPLING AND ANALYSIS PLAN
APPENDIX B - QUALITY ASSURANCE ADDENDUM

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
OPERABLE UNIT 9

U.S DEPARTMENT OF ENERGY
Rocky Flats Environmental Technology Site
Golden, Colorado

JANUARY 1996

30

TABLE OF CONTENTS **PAGE**

LIST OF FIGURES

LIST OF TABLES

1.0 PURPOSE

The purpose of the QAA is to identify QA requirements that are applicable to this removal action and to identify measures for implementing these requirements.

This QAA is intended to supplement the *Rocky Flats Environmental Technology Site Site-Wide Quality Assurance Project Plan for Comprehensive Environmental Response Compensation Liability Act (CERCLA) Remedial Investigation/ Feasibility Studies and RCRA Facility Investigations/Corrective Measures Studies Activities* (referred to as the RFP Site-Wide QAPjP, or simply QAPjP). As a supplement to the QAPjP, this QAA establishes the site-specific measures and QA controls applicable to the actions described in this SAP.

2.0 SCOPE

This QAA addresses all quality-related activities as described in the SAP to be performed by the Contractor of designated Subcontractor at RFETS

The major actions within this SAP, to which this QAA applies, include:

- Definition of DQOs;
- Collection of field data;
- Sample collection and analysis;
- Quality control samples;
- Sample handling and shipping; and
- Data analysis.

3.0 BASIS FOR TECHNICAL ACTIVITY

The work outlined in the preceding SAP identifies the specific analytical needs, sampling requirements, data handling requirements and associated QA/QC requirements. This includes the completion of three main activities, which are:

I. Sampling of sludges for waste characterization purposes;

II. Sampling of rinse waters (rinsates) generated during the rinsing of tanks; and

III. Sampling of rinsates generated from the final rinsing effort of the tanks.

4.0 QUALITY REQUIREMENTS

4.1 Organization and Responsibilities

Rocky Mountain Remediation Services (RMRS) is responsible for the overall coordination of the this sampling event. Other organizations such as the Analytical Projects Office and the analytical laboratory (internal or subcontracted) will be involved with this work. Responsibilities of other organizations will be assigned by RMRS.

An organization chart for this project is shown in Figure 4-1. The organization has been structured to maintain a high level of quality in all areas of work to be performed. Conformance to established requirements will be verified by individuals and groups not directly responsible for performing the work. RMRS is responsible for management and coordination of the resources dedicated to the project.

4.2 Design Control and Control of Scientific Investigations

4.2.1 Design Control

This SAP describes the general design considerations for implementing work activities, outlining sampling and analysis techniques, describing analytical requirements, and summarizing data management processes.

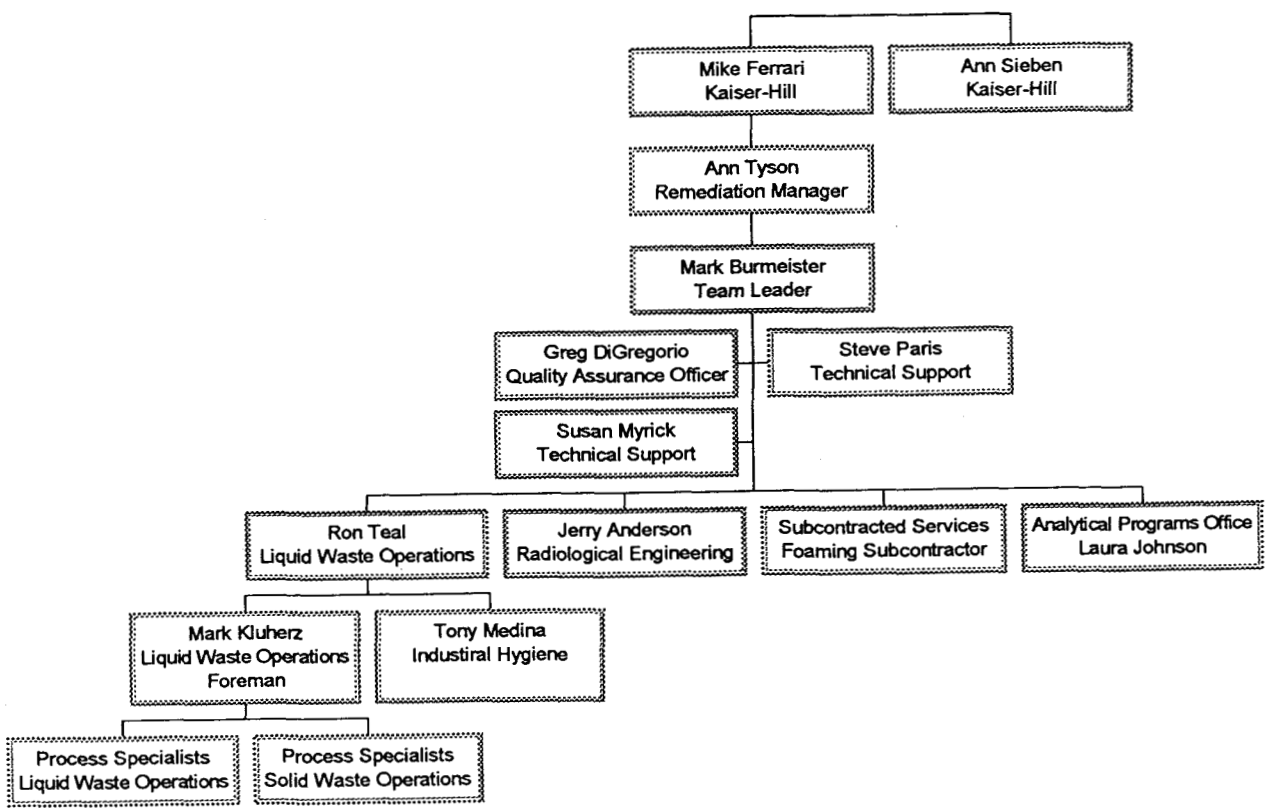
The QAPjP considers activities that generate analytical data, which requires collection and analysis of environmental samples to be scientific investigations. Controls for scientific investigations include:

- Developing DQOs;
- Collecting and analyzing samples according to approved procedures;
- Establishing and implementing quality controls; and
- Reducing and reporting data in a controlled manner.

4.2.2 Data Quality Objectives

DQOs quantitatively and qualitatively describe the uncertainty that decision makers are willing to accept in results derived from environmental data. DQOs were established to make decisions on the number of samples required, as specified in *Guidance for Planning for Data Collection in Support of Environmental Decision Making Using Data Quality Objective Process* (EPA QA/G4). Many of the seven steps in the DQO process have been used as a planning tool and the results of the process are summarized below:

Figure 4-1
Project Organization Chart



State the Problem

(1) *Identify members of the planning team:* The planning team members include the Project Manager, the Accelerated Actions group's Team Leader, Environmental Safety, Health and Quality's Quality Assurance Officer, and a Waste Programs Representative.

(2) *Identify the primary decision maker:* There will be no primary decision maker; separate decisions will either be allocated to members of the planning team or made by consensus.

(3) *Develop a concise description of the problem:* The problem has been divided into the three activities that will be completed as part of the sampling activity. The problems are to:

I. Determine when rinse efforts are no longer effective in the removal of residuals in the tanks (<30% effective).

II. Determine the chemical composition of the rinsate generated from the final rinsing effort of the tank.

III. Determine waste characterization of sludges generated from the removal action which have not been previously characterized.

(4) *Specify available resources and relevant deadlines for the study:* The removal actions must be completed in fiscal year (FY) 1996. The tanks sources must be removed in FY96 in order to obtain a specific performance measure. Cost is a factor on this project, and sampling cost must be kept at a minimum, while maintaining the highest level of quality assurance/quality control.

Identify the Decision:

(1) *State the decision(s):* Is the tank rinsing effort complete?
What type of waste is the sludge generated from this effort.

(2) *State the actions that could result form the decision:*
Decisions made based on the sample results will be:

I. Has rinsing effort been effective (i.e. would additional efforts remove additional residual materials from the tank).

a) Final rinsate sampling can begin at the tank.
b) Rinsing activities must continue until the residual are no longer mobilized.

II. Do the final rinsate water sample results confirm the rinsing process was effective in removing residual contamination to the extent possible by the method utilized.

a) Fill tank with closed-cell foam for interim closure pending clean closure.
b) Fill tank with closed-cell foam for interim closure pending closure as a landfill.

III. Is the waste a RCRA regulated, low level radioactive, transuranic, mixed, or a solid waste?

a) The waste will be managed as a RCRA hazardous waste.
b) The waste will be managed as a low level waste.
c) The waste will be managed as a transuranic waste.
d) The waste will be managed as a mixed waste.
e) The waste will be managed as a solid waste.

Identify Inputs to the Decision:

(1) *Identify the information that will be required to make a decision:*

I. To evaluate the condition of the tanks the planning team must determine if additional rinsing efforts will have any beneficial effect of removing residual material from the tanks. Indicator parameters, metals, VOCs, and rad screens results will be compare to previous rinsing efforts on a time series plot.

II. To evaluate the problem, the planning team must collect samples of the final rinsate to analyze for metals, VOAs, semi-VOAs, and radionuclides.

III. To evaluate the problem the planning team must collect samples from waste and analyze for the characterization parameters.

(2) *Determine the sources of each item of information identified:*

I. The source of information will be analytical results from samples collected following rinsing efforts.

II. The source of information will be the analytical results from the sample collected following the final rinsate effort.

III. The source of information will be the results the analytical results from the sludge samples.
(3) *Identify the information that is need to establish the action level for the study:*

I. The action level for rinsing the tanks shall be; after a minimum of three rinses the results from selected indicator compounds from the metals sweep, VOC sweep, and radioactivity screen shall be within 30% of the previous sample results.

II. Action levels for the final rinsate samples: Action levels currently do not exist for the final rinsate samples.

III. The action levels will be:

a) The waste acceptance criteria for a permitted RCRA hazardous waste disposal facility.
b) The waste acceptance criteria for at a low level waste disposal facility.
c) The waste acceptance criteria for a transuranic waste disposal facility.
d) The waste acceptance criteria for a mixed waste disposal landfill.
e) The waste acceptance criteria for a sanitary landfill.

(4) *Confirm that appropriate filed sampling techniques and analytical methods exist to provide the necessary data.*

I. Rinsate samples will be collected utilizing procedure L-6294A, Sample Procedures for Waste Characterization. Analytical methods will include a metals sweep, VOC sweep, and radioactivity screen.

II. Final rinsate samples will be collected utilizing procedure L-6294A, Sample Procedures for Waste Characterization. Analytical methods include radioanalytical by gas proportional counting, EPA-CLP VOC Target Compound List, Semi-VOCs by EPA Method 625, and Method EPA-CLP Target Analyte List for metals.

III. Waste characterization samples will be collected utilizing procedure L-6294A, Sample Procedures for Waste Characterization. Analytical methods include radioanalytical by gas proportional counting, EPA-CLP VOC Target Compound List, Semi-VOCs by EPA Method 625, and Method EPA-CLP Target Analyte List for metals.

Define the Boundaries of the Corrective Action

(1) *Define the spatial boundary of the decision:*

37

(a) *Define the domain or geographic area within which all decisions must apply*:

I. Decision will apply to the volume of rinsates generated during the rinsing of the tanks.

II. Decisions will apply to the volume of water generated from the final rinsing of the tank.

III. Decisions will apply to the volume of the waste containers.

(b) *Specify the characteristics that define the population that will be studied:*

I. Waters generated from rinsing the tanks.

II. Waters generated from the final rinse of the tank.

III. Sludges will be generated during the source removal process.

(c) *Define the scale of decision making;*

I. The scale of decision making will be based on the size of the tank.

II. The scale of decision making will be based on the size of the tank.

III. The scale of decision will be based on the number of waste containers generated during remedial activities.

(2) *Define the temporal boundary of the decision:*

(a) *Determine when to collect data:*

I. Rinsate samples will be collected following each complete rinsing of the tank, a minimum of three rinsate samples will be collected.

II. Final rinsate samples will be collected following the final rinse of the tank.

III. The data will be collected after all waste containers are filled, in order to determine the total number of containers that will need to be sampled.

(b) *Determine the time frame in which the study data apply:*

I. The sampling data will represent the quality of rinse water following each rinsing effort.

II. The sampling data will represent the quality of the final rinse water.

III. The sampling data will represent the results of soil materials in the waste containers.

(3) *Identify practical constraints on data collection:*

I. Access to the tanks may be limited.

II. Access to the tanks may be limited.

III. None.

Develop a Decision Rule

(1) *Specify the parameter that characterizes the population of interest:*

I. VOC sweep results, metal sweep results and radioactivity screens will be utilized to determine the effectiveness of the rinsing effort.

II. VOCs, Semi-VOCs, metals and radioactivity in the final rinse waters will be utilized to determine the condition of the tanks following the final rinse

III. The concentration of RCRA constituents and radioactivity levels will be compared to waste disposal criteria for selected disposal facilities.

(2) *Specify the action level for the study:*

I. The action level for this decision is the analytical results from the third rinse are within 30% of the results from the second rinse.

II. The action level for this decision have not been determined.

III. The action level for this decision is the waste acceptance criteria for the selected waste disposal facility.

3) *Develop a decision rule:*

I. If the analytical results from the third rinse are greater than 30% of the second rinse, the tank will require an additional rinse effort until the 30% is acheived.

II. The decision rule will be that the final rinsate sample results indicate the tank was "clean" prior to filling with foam.

III, The waste will be disposed of after the laboratory results indicates whether the waste is RCRA regulated, low level, transuranic, mixed, solid waste.

Specify Acceptable Limits on the Decision Error

Sampling conducted under the IAG UST Source Removal Program is designed as a judgmental sampling program and not statistically based. Therefore, no hypothesis is being tested and limits on the decision error are not applicable.

Optimize the Design

There must be a high level of confidence that the data generated from samples collected in the field represent actual conditions. Data generated from the removal action will be compared to existing data and evaluated to determine is new data is representative.

Quality is also an accurate representation of the actual waste condition. This confidence level will be maintained by taking duplicate samples and equipment rinsates, ensuring the proper number of confirmation and waste container samples are collected, and by following the PARCC parameters as defined in Table 4-1.

4.2.3 Equipment Decontamination

Sampling equipment that is used at more than one location shall be decontaminated between sampling locations in accordance with Section 6.22, Equipment Decontamination, in Procedure L-6245-F, *Sampling Procedure for Waste Characterization*. The decontamination effort will be documented in accordance Section 8, Records of Procedure L-6245-F.

4.2.4 Quality Control

Field sampling quality control will be conducted for definative sampling only (blank and final rinse samples) and consist of:

40

- Collection of field duplicate samples will be at a minimum of 1 per 20 samples.
- Preparation and analysis of an equipment rinsate blank for every 20 samples collected (at a minimum or at least one rinsate blank if 20 samples are not collected).
- Trip blanks for VOC analysis at a frequency of a VOC trip blank per shipment.

TABLE 4-1
PARCC PARAMETER SUMMARY

	RADIONUCLIDES	ANALYTICAL
PRECISION	RPD £ 200% for Pu and Am RPD £ 30% all others	RPD £ 20% for liquid RPD £ 30% for solid
ACCURACY	Detection limits in GRRASP	Comparison of Lab Control Samples with true values
REPRESENTIVENESS	Based on Use of SOPs and Work Plans	Based on Use of SOPs and Work Plans
COMPARABILITY	Based on Use of SOPs and Work Plans	Based on Use of SOPs and Work Plans
COMPLETENESS	90% Usable 100% Lab Validation	90% Usable 100% Lab Validation

4.3 Document Control

Documents produced by that control the work described in this Sampling and Analysis Plan will be "controlled" to ensure that key project personnel receive accurate and up to date information. Such documents will be controlled in accordance with Section 8.0 of Procedure L-6245, *Sampling Procedure for Waste Characterization.*

4.4 Quality Verification

The remaining quality elements of the project will be consistent with a graded approach of DOE Order 5700.6C.

REVIEW COMMENT SHEET

Time Spent on Review: _____ hrs.

Return to:

FAX _____ Name _____ Ext. _____ Location _____

If questions on content, please call the SME:

Name _____ Ext. _____

Page _____ of _____

Please review the attached procedure: Number _____ Rev. _____ Draft _____ Title _____

Comment Due Date: _____

☐ Internal Review ☐ Parallel Review ☐ Verification ☐ Validation ☐ Revalidation

General (G) comments require resolution but do not require resolution acceptance. Mandatory (M) comments require resolution and resolution acceptance.
1-A03-PPG-004 provides complete definitions of General and Mandatory comments.

TYPE G or M	PAGE	SECTION OR LINE #	COMMENT	DISPOSITION	Disposition Accepted INIT/DATE

POC/Reviewer: (Comments not signed by POC/Reviewer will be considered unofficial and not subject to resolution)

n No Comments

n This procedure revision has no impact or relevance to our discipline or organization and we waive need to concur.

Name _____ Signature _____

Ext./Pager/Fax _____ Bldg./Dept./AGM _____ Date _____

Resolutions Accepted

Initials _____ Date _____

NOTE: These reviews are completed by qualified reviewers in accordance with 1-A03-PPG-004 in concert with 1-A01-PPG-001 and 1-A02-PPG-003.

RF-47947 (5/93)

42/42